That which is claimed is:

1. A process for the production of refinery transportation fuel or blending components for refinery transportation fuel, which process comprises:

providing a petroleum feedstock comprising a mixture of hydrocarbons, sulfur-containing and nitrogen-containing organic compounds, the mixture having a gravity ranging from about 10° API to about 75° API;

fractionating the petroleum feedstock by distillation to provide at least one low-boiling blending component consisting of a sulfur-lean, mono-aromatic-rich fraction, and a high-boiling oxidation feedstock consisting of a sulfur-rich, mono-aromatic-lean fraction;

contacting the high-boiling oxidation feedstock with a soluble quaternary ammonium salt containing halogen, sulfate, or bisulfate anion, and an immiscible aqueous phase comprising a source of hydrogen peroxide, and at least one member of the group consisting of phosphomolybdic acid and phosphotungstic acid, in a liquid reaction mixture under conditions suitable for reaction of one or more of the sulfur-containing and/or nitrogen-containing organic compounds;

separating from the reaction mixture both an essentially organic liquid and at least a portion of the immiscible aqueous phase; and

recovering from the organic liquid a product comprising a mixture of organic compounds containing less sulfur and/or less nitrogen than the high-boiling oxidation feedstock.

2. The process according to claim 1 wherein the soluble quaternary ammonium salt is represented by formula

$$CH_3N(R)_3X$$

where X is a halogen, sulfate, or bisulfate anion, and the R's are the same or different hydrocarbon moieties of at least 4 carbon atoms.

3. The process according to claim 2 wherein X is selected from the group consisting of chlorine anion and bromine anion.

4. The process according to claim 1 wherein the immiscible aqueous phase consists essentially of water, a source of hydrogen peroxide, and phosphotungstic acid.

5. The process according to claim 4 wherein the soluble quaternary ammonium salt is represented by formula

$$CH_3N(R)_3X$$

where X is a chlorine anion or sulfate anion, and the R is a hydrocarbon moiety of about 7 to about 10 carbon atoms.

6. The process according to claim 1 wherein at least a portion of the separated aqueous phase is recycled to the reaction mixture.

7. The process according to claim 1 wherein all or at least a portion of the petroleum feedstock is a product of a hydrotreating process for petroleum distillate consisting essentially of material boiling between about 50° C. and about 425° C. which hydrotreating process includes reacting the petroleum distillate with a source of hydrogen at hydrogenation conditions in the presence of a hydrogenation catalyst to assist by hydrogenation removal of sulfur and/or nitrogen from the hydrotreated petroleum feedstock.

8. The process according to claim 7 further comprising blending at least a portion of the low-boiling blending component with the product containing less sulfur and/or less nitrogen than the high-boiling oxidation feedstock to obtain a component for refinery blending of transportation fuel.

9. The process according to claim 1 wherein the high-boiling oxidation feedstock consists essentially of material boiling between about 200° C. and about 425° C.

10. The process according to claim 1 wherein the conditions of oxidation include temperatures in a range upward from about 25° C. to about 250° C. and sufficient pressure to maintain the reaction mixture substantially in a liquid phase.

11. A process for the production of refinery transportation fuel or blending components for refinery transportation fuel, which process comprises:

hydrotreating a petroleum distillate consisting essentially of material boiling between about 50° C. and about 425° C. by a process which includes reacting the petroleum distillate with a source of hydrogen at hydrogenation conditions in the presence of a hydrogenation catalyst to assist by hydrogenation removal of sulfur and/or nitrogen from the hydrotreated petroleum distillate;

fractionating the hydrotreated petroleum distillate by distillation to provide at least one low-boiling blending component consisting of a sulfur-lean, mono-aromatic-rich fraction, and a high-boiling oxidation feedstock consisting of a sulfur-rich, mono-aromatic-lean fraction;

contacting the high-boiling oxidation feedstock with a soluble quaternary ammonium salt containing halogen, sulfate, or bisulfate anion, and an immiscible aqueous phase comprising a source of hydrogen peroxide, and at least one member of the group consisting of phosphomolybdic acid and phosphotungstic acid, in a liquid reaction mixture under conditions suitable for reaction of one or more of the sulfur-containing and/or nitrogen-containing organic compounds;

separating from the reaction mixture an essentially organic liquid and at least a portion of the immiscible aqueous phase; and

treating at least a portion of the recovered organic liquid with a solid sorbent, an ion exchange resin, and/or a suitable immiscible liquid containing a solvent or a soluble basic chemical compound, to obtain a product containing less sulfur and/or less nitrogen than the oxidation feedstock.

12. The process according to claim 11 wherein the soluble quaternary ammonium salt is represented by formula

$$CH_3N(R)_3X$$

where X is selected from the group consisting of chlorine anion and sulfate anion, and the R is a hydrocarbon moiety of about 7 to about 10 carbon atoms.

13. The process according to claim 12 wherein the immiscible aqueous phase consists essentially of water, a source of hydrogen peroxide, and phosphotungstic acid.

14. The process according to claim 13 wherein at least a portion of the separated aqueous phase is recycled to the reaction mixture.

15. The process according to claim 12 wherein the treating of recovered organic liquid includes use of at least one immiscible liquid comprising a solvent having a dielectric constant suitable to selectively extract oxidized sulfur-containing and/or nitrogen-containing organic compounds.

16. The process according to claim 15 wherein the solvent comprises a compound selected from the group consisting of water, methanol, ethanol and mixtures thereof.

17. The process according to claim 11 wherein the soluble quaternary ammonium salt is represented by formula

$$CH_3N[(CH_2)_7CH_3]_3X$$

where X is selected from the group consisting of chlorine anion and sulfate anion, and the immiscible aqueous phase consists essentially of water, a source of hydrogen peroxide, and phosphotungstic acid.

18. The process according to claim 17 wherein the treating of recovered organic liquid includes use of at least one solid sorbent comprising silica.

19. The process according to claim 18 further comprising blending at least a portion of the low-boiling fraction with the product containing less sulfur and/or less nitrogen than the oxidation feedstock to obtain components for refinery blending of a transportation fuel.

20. The process according to claim 17 wherein the treating of recovered organic liquid includes use of at least one immiscible liquid comprising an aqueous solution of a soluble basic chemical compound selected from the group consisting of sodium, potassium, barium, calcium and magnesium in the form of hydroxide, carbonate or bicarbonate.

21. A process for the production of refinery transportation fuel or blending components for refinery transportation fuel, which process comprises:

hydrotreating a petroleum distillate consisting essentially of material boiling between about 50° C. and about 425° C. by a process which includes reacting the petroleum distillate with a source of hydrogen at hydrogenation conditions in the presence of a hydrogenation catalyst to assist by hydrogenation removal of sulfur and/or nitrogen from the hydrotreated petroleum distillate;

contacting the hydrotreated petroleum distillate with a soluble quaternary ammonium salt containing halogen, sulfate, or bisulfate anion, and an immiscible aqueous phase comprising a source of hydrogen peroxide, and at least one phospho-metallic acid, in a liquid reaction mixture under conditions suitable for reaction of one or more of the sulfur-containing organic compounds;

separating from the reaction mixture both an essentially organic liquid and at least a portion of the immiscible aqueous phase; and

recovering from the organic liquid a product comprising a mixture of organic compounds containing less sulfur and/or less nitrogen than the high-boiling oxidation feedstock.